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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jun Kusui

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EXAMINER

PALABRICA, RICARDO J

ART UNIT

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3663

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/556,527	Applicant(s) KUSUI ET AL.	
	Examiner Rick Palabrica	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/14/05 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's 2/13/08 election with traverse of Group I (Product), species of boron compound and manganese for the body portion, species of magnesium for the surface layer, and species of rolling and cold isostatic pressing for the processes applied to the making the neutron absorber, is acknowledged.

Applicant identifies claims 1-9 as reading on the elected invention.

2. Applicant argues that Group I (Product) and Group II (Process for Manufacturing the Product) meet the unity of invention requirement, and the restriction requirement between the two groups is improper, as per Rule 1.475(b)(1). The examiner disagrees.

The Rule cited by the applicant qualifies the combination of a product and a process specially adapted for the manufacture of said product for consideration of meeting the unity of invention requirement, as evidenced by the language in the passage cited by the applicant, i.e.,

"b) An international or a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:

(1) A product and a process specially adapted for the manufacture of said product;" Underlining provided.

If the claims pass the criterion in Rule 1.475, they are now subjected to Rule 1.476, which states:

"§ 1.476 Determination of unity of invention before the International Searching Authority.

(a) Before establishing the international search report, the International Searching Authority will determine whether the international application complies with the requirement of unity of invention as set forth in § 1.475.

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...
(d) *Lack of unity of invention may be directly evident before considering the claims in relation to any prior art, or after taking the prior art into consideration, as where a document discovered during the search shows the invention claimed in a generic or linking claim lacks novelty or is clearly obvious, leaving two or more claims joined thereby without a common inventive concept. In such a case the International Searching Authority may raise the objection of lack of unity of invention.* Underlining provided.

In section 1 of the 1/18/08 Office action, the examiner showed that the general inventive concept of the claims (e.g., claim 10) does not define over the teachings in a prior art.

Clearly, applicant's two groups of inventions appear to meet the unity of invention requirement "*a priori*", i.e., before considering the claims in relation to prior art (under Rule 1.475), but fails to meet the requirement "*a posteriori*", after taking the prior art into consideration (under Rule 1.476).

The restriction requirement is still deemed proper and is therefore made **FINAL**.

Drawings

3. Color photographs and color drawings (sheets 1, 7-10, and 12-16) are not accepted unless a petition filed under 37 CFR 1.84(a)(2) is granted. Any such petition must be accompanied by the appropriate fee set forth in 37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and, unless already present, an amendment to include the following language as the first paragraph of the brief description of the drawings section of the specification:

The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

Color photographs will be accepted if the conditions for accepting color drawings and black and white photographs have been satisfied. See 37 CFR 1.84(b)(2).

Also, the specification and the drawings do not correlate. For example, the specification at page 6 refers to Fig. 1 but this figure is depicted on sheet 2 (not sheet 1) in the drawings.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roczyn (U.S. 4,631,236) in view of Sakaguchi et al. (U.S. 6,602,314). Roczyn discloses the applicant's claim limitations except for the particle sizes of the boron and aluminum alloy powders.

As to claims 1 and 6, Roczyn teaches an aluminum-based extruded neutron absorber (e.g., see Abstract and Figs. 1 and 2). Applicant's claim language reads on Roczyn as follows: a) "body portion" reads on core 11; b) "surface layer portion" reads on mantel 12.

As to the body portion consisting of an aluminum alloy with a boron content of 20-40%, and surface layer consisting of an aluminum alloy whose boron content is 1% by mass or less, note the following teachings in Roczyn:

"The billet according to the present invention for manufacturing sections, rods or pipes from the above mentioned alloys containing boron, comprises a core of boron-containing aluminum alloy which is surrounded by a mantel of boron-free aluminum alloy." See col. 1, lines 55+

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"The foregoing object is achieved by way of a process wherein a billet having a core of aluminum alloy containing additions of boron or compounds thereof and a mantel enclosing the same are manufactured and shaped by extrusion, preferably employing as basis blanks which are made via the molten metal route or powder metallurgy and viz., from an aluminum-based material of the alloy group/groups: high purity aluminum, AlFe, AlFeSi, AlMn, AlMg, AlMgMn, AlMgSi, AlZnMg, AlZnMgCu, AlCuMg, AlCuSiMn with additions of boron or its compounds (preferably B.sub.4 C) at a concentration of 0.05 and 50 wt %." Underlining provided. See col. 1, lines 33+.

As to Roczy meeting the claimed boron contents of the body portion and the surface layer portion, note MPEP 2131.03, which states:

"[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is 'anticipated' if one of them is in the prior art." Titanium Metals Corp. v. Banner; 778 F.2d 775, 227 USPQ 773.

Sakaguchi et al. teach an aluminum-based extruded neutron absorber obtained from mixing an aluminum alloy powder having a mean particle size of 5-150 μm , with a boron compound powder having a mean particle size of 1-60 μm .

Sakaguchi et al. teach the following reason why the 5-150 μm size for the aluminum alloy powder is advantageous:

"The reason for this is that, since the particles end up aggregating due to being in the form of fine particles if the mean particle size is less than 5 μm , the particles eventually take on the form of large clumps and place limitations on production by atomization (because it becomes necessary to remove only fine particles, the powder production yield is worsened considerably resulting in a sudden increase in costs). If the mean particle size exceeds 150 μm , there are limitations on product by atomization since they are no longer solidify by rapid-cooling. In addition, there are also problems in terms of the difficulty in uniformly mixing with fine added particles. Thus, the most preferable mean particle size is 50-120 μm ." See col. 4, lines 58+.

Sakaguchi et al. then teach the following reason why the 1-60 μm size for the boron compound powder is advantageous:

"In addition, a B or B compound powder is used that preferably has a mean particle size of 1-60 μm . The reason for this is that, since each particle aggregates due to being in the form of a fine powder if the mean particle size is less than 1 μm , the powder ultimately takes on the form of large clumps, thereby preventing the obtaining of a

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uniform dispersion and having an extremely detrimental effect on yield. If mean particle size exceeds 60 μm , not only does the powder become a contaminant which lowers the material strength and ease of extrusion it also ends up worsening the cutting workability of the material." See col. 5, lines 51+.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the product and process, as disclosed by Roczyn, by the teaching of Sakaguchi et al., to use the claimed particle sizes of the boron and aluminum alloy powders, to gain the advantages thereof (i.e., as highlighted by Sakaguchi et al.), because such modification is no more than the use of a well known expedient within the nuclear art.

As to claims 4 and 5, Roczyn, teaches the use of manganese and magnesium with the aluminum alloy (see col. 1, lines 33+).

As to claim 7, Roczyn, teaches the use of boron carbide (see col. 1, lines 33+).

As to claim 8, this is product-by-process claim. MPEP 2113 states:

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777F.2d 695, 698, 227 USPQ 964, 966.

Notwithstanding the above, the Roczyn-Sakaguchi et al. combination meets the claim limitation because of the teaching of rolling the neutron absorber (see col. 4, lines 53+).

As to claim 2, the thickness of the surface layer portion is a parameter that depends on the design constraints of the specific application where the neutron absorber is employed. This thickness, for example, may be limited by weight or structural requirements of the cask or canister where the neutron absorber is used. Note

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in this regard, the following statement in Sakaguchi et al. that the thickness of the absorber is a function of said design requirements:

"In the case of considering the use of aluminum alloy (and aluminum-based composite material) as a structural material in the field of nuclear power, and more specifically, as a structural material of a storage or transport container of spent nuclear fuel, the thickness of the members is necessarily from about 5 to 30 mm. In the case of a thick-walled material that exceeds this range, it becomes pointless to use a light aluminum alloy, while on the other hand, in order to secure adequate reliability required by structural materials, it is clear that it would be difficult to use an extremely thin-walled member in consideration of the ordinary strength of aluminum alloy." See col. 4, lines 29+.

As to claim 3, again the shape and specific thicknesses of the elements that comprise the surface layer of the neutron absorber would depend on specifically where it is used. Where the absorber is used as a basket for accommodating spent fuel rods in a transportation cask, then this absorber should have a plate-shaped configuration. A person of ordinary skill in the art would have found obvious the use of said plate configuration for said basket. As to the thicknesses of the elements of the surface layer, again these would depend on the design constraints of the particular application, as discussed in relation to claim 2 above.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roczyn in view of Sakaguchi et al., as applied to claims 1-8 above, and further in view of either one of Ohsono et al. (6,839,395) or Wells et al. (U.S. 4,827,139). Roczyn in view of Sakaguchi et al. teaches the applicant's claim limitations except for the basket for accommodating nuclear fuel.

Ohsono et al. (6,839,395) al teach a basket 130 for spent nuclear fuel formed from an aluminum alloy with boron (see Fig. 5a and col. 14, lines 49+).

Wells et al. (U.S. 4,827,139) teach a spent nuclear fuel basket wherein the spacer members are made of an alloy of aluminum and boron (see Fig. 5 and claim 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the product, as disclosed by the Roczyn-Sakaguchi et al. combination, by the teaching in either one of Ohsono et al. or Wells et al., as a basket for accommodating spent nuclear fuel, because such modification is no more than the use of a well known expedient within the nuclear art, and the substitution of one basket material by another well-known material.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 571-272-6880. The examiner can normally be reached on 6:00-4:30, Mon-Thurs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rick Palabrica/
Primary Examiner, Art Unit 3663

March 4, 2008